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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Technical Standards Committees
(Electric)

Supplement No. 1, October 1982, to
REA Bulletin 43-5
LIST OF MATERIALS ACCEPTABLE FOR USE ON
SYSTEMS OF REA ELECTRIFICATION BORROWERS

The attached pages for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of July through September 1982. The following changes should be made in order to keep it up to date. Pages with a colon between are on the same sheet, both being changed.

<u>Add</u> <u>New Page</u>	<u>Remove</u> <u>Page</u>	<u>Add</u> <u>New Page</u>	<u>Remove</u> <u>Page</u>
d	d	U he(3.1)	U he(3.1)
1-3	1-3	U hp(5)	U hp(5)
p-3	p-3		
p-11	p-11		
v	v		
ae(Cond.)	ae(Cond.)		
ax-1	ax-1		
be(4)	be(4)		
cg-1	cg-1		
cg(1):cg(2)	cg(1):cg(2)		
cp	cp		
ei	ei		
fj, fk, fl	fj, fk, fl		
gw-2	gw-2		
gy-2	gy-2		
sb-1	sb-1		
sb-3	sb-3		
sc-1:sc-2	sc-1:sc-2		
zy-1	zy		
zy-2	-		
zz-5	zz-5		
U an-1.1	U an-1.1		
U ax	U ax		
U fz-1	U fz-1		
U gk(1.1)	U gk(1.1)		

PRODUCTION
CURRENT SERIAL RECORDS

FEB 22 '83

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c - Bolt, machine

Applicable Specifications: Edison Electric Institute
Specification TDJ-1 1969,
"Specifications for Steel
Bolts and Nuts"

Applicable Sizes : 1/2 inch diameter, 6 through
10 inch length

5/8 inch diameter, 6 through
24 inch length

3/4 inch diameter, 6 through
26 inch length

7/8 inch diameter, 6 through
28 inch length

The following manufacturers have shown compliance with the applicable
specifications for machine bolts:

A. B. Chance Company
Dixie Electrical Manufacturing Company

Hughes Brothers
*Joslyn Manufacturing and Supply Company
Kortick Manufacturing Company
*McGraw-Edison

Utilities Service Company



*"Static proof" design available.

d - Washers
Flat Steel

Size, inches:	2 1/4 x 2 1/4	3 x 3	4 x 4	4 x 4	1-3/8 round	1-3/4 round
Thickness, in.:	3/16	1/4	3/16	1/2	12 gauge	10 gauge
Hole Diam., in.:	13/16	13/16	13/16	13/16	9/16	11/16

Chance	6814	6817	6818	6819 1/2	6803	6805
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Dixie	D6814	D6817	D6818	D6819 1/2	D6803	-
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Hughes	SW2 1/4-70	SW3-70	SW4-70	SW4-70 (1/2)	RW1-3/8-50	-
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Joslyn	J1076	J22596	J1080	J1473	J1086	-
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Kortick	K1553	K1555	K1557	K1559 1/2	K1524	K1525
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McGraw-Edison	DF2W5	DF2W7	DF2W10	DF2W15	DF1W2	DF1W3
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Power Line Hardware	SWF-225A					
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Utilities Serv.	5485	5487A	5488	5490A	5478	5479
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Size, inches:	2 1/4 x 2 1/4	3 x 3	3 x 4	4 x 4	3 round
Thickness, in.:	1/4	5/16	7/16	1/2	3/16
Hole Diam., in.:	11/16	11/16	15/16	13/16	13/16 (spurred)
Barron Bethea (Nodular Iron)	GCW-1A* BB-214	GCW-31*	CRW-4A*	GCW-41*	-
Bethea/National (Aluminum Alloy)	-	WC-33-5*	WC-34-7*	WC-44-6*	-
Continental (Nodular Iron)	-	CW-33-5*	CW-34-7*	CW-44-6*	TCSF-30-6
Flagg (MIF) (Malleable Iron)	P141* P56A	P143*	P120*	P144*	PX159A
Joslyn (Steel)	-	J114*	-	-	-
Lapp (Line Ware) (Malleable Iron)	304075* 304089	304078*	-	304082*	-

Power Line Hardware	CSW-33*	CRW-34*	CSW-44*
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* Curved

1 - Deadend for Steel Strand (Overhead Ground Wire)

TRANSMISSION

For High Strength Steel Strand and Aluminum-Clad Steel Strand

Clamp Type

<u>High Strength Steel</u>		<u>Aluminum-Clad Steel</u>		
<u>Manufacturer</u>	<u>3/8" and 7/16"</u>	<u>7 No. 9 AWG</u>	<u>7 No. 8 AWG</u>	<u>7 No. 7 AWG</u>
Anderson/Sq. D	SWDE-55N			
Bethea/National	FD-550-N (For use on 3/8" steel strand only)			
Ohio Brass	80437			

1 - Deadend for steel strand (overhead ground wire)

TRANSMISSION

For high strength, extra high strength steel strand and aluminum clad steel strand

<u>Manufacturer</u>	<u>Compression Type</u>			
	<u>High strength steel</u> <u>3/8"</u>	<u>7/16"</u>	<u>Aluminum-clad steel</u> <u>7 No. 9 AWG 7 No. 8 AWG 7 No. 7 AWG</u>	<u>Extra High Strength</u> <u>5/16" 3/8" 7/16"</u>
Fargo	82S712	82S714	82A79 82A78 82A77	82S710 82S712 82S714
Alcoa	4620.12	4627.14		
Burndy	YTW375E	YTW438E	YTW7M9T YTW7M8T YTW7M7T	

Somerset
Order by wire size
and type.

Formed Type

Chance		16M AWSBG	20M AWSBG
Helical Line Prod.	HG210-3/8	HG211-7/16	HG523-12.5M HG525-16M HG528-20M HG209-5/16 HG210-3/8 HG211-7/16

Automatic Type

Fargo	GDE-302	GDE-303	GDE-302	GDE-303	GDE-301	GDE-302	GDE-303
Reliable	5202	5203	5202	5202	5203		

p - Connectors, Distribution (Parallel Groove)

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to Copper or Copperweld-Copper

	ACSR Size (Bare Conductor)				
	3/0	2/0	1/0	2	4
Alcoa	197	R193	R193	195	195
Anderson/Sq. D	LC-811A	LC-811A	LC-522A	LC-511A	LC-511A
Blackburn	PAC7	PAC7	PAC4	2CA	4CA
Fargo	GA-616C	GA-616C	GA-620C	GA-620C	GA-620C
Joslyn	600ALC	555ALC	438ALC	438ALC	438ALC
Reliable	600ALC	555ALC	438ALC	438ALC	438ALC
Weaver	-	-	-	2WCA	2WCA

ACSR Size (Over Armor Rods)

	3/0	2/0	1/0	2	4
Alcoa	201	R197	R197	R197	199
Anderson/Sq. D	LC-833	LC-833	LC-811A	LC-811A	LC-811
Blackburn	-	-	PAC7	PAC7	PAC7
Fargo	GA-9843C	GA-9842C	GA-616C	GA-616C	GA-616C
Joslyn	-	-	744ALC	600ALC	600ALC
Reliable	-	-	744ALC	600ALC	600ALC

p - Connectors, Distribution

Applicable Specification: "REA Specification for Connectors," DT-8

Copper Type Conductors

Connections to same size or smaller

Copper	2A 0x7	2x3	4A	6A 4	8A 6
<u>Bare Conductor</u>					
Anderson/Sq. D	DG-1/0	DG-1	DG-2	DG-4	DG-6
(s) Blackburn	RT11	RT02	RT02	RT04	RT06
(s) Burndy	KS-25	KS-23	KS-23	KS-20	KS-17
(s) Dossert	DS-10-F	DS-6-F	DS-6-F	DS-3-F	DS-2-F
(s) Fargo	GC-5020	GC-5002S	GC-5002	GC-5004	GC-5006
(s) Frankel	B-1/0	B-2	B-3	B-4	B-6
(s) Greaves	-	A-8	-	A-5	A-3
(s) ILSCO	IK-1/0	IK-2	IK-2	IK-4	IK-6
(s) Joslyn	-	IF	2F	4F	6F
(s) Kearney	118109	118109	118108	118104	118102
(s) Krueger & Hudepohl	UC58C-EV	-	-	-	-
(s) Penn-Union	S1/0	S2	S3	S4	S6
(s) Reliable	-	1F	2F	4F	6F
(s) Royal Elec. Mfg.	1739	1739	-	-	-
(s) Sherman	TS1/0	TS2ST	TS-2	TS-4	TS-6
(s) Weaver	10W	1W	2W	4W	6W

Over Armor Rods

Anderson/Sq. D	K-5	K-4	K-4	K-2	K-2
Blackburn	2B350	2B350	2B4/0	2B2/0	2B1/0
Burndy	KVS-31	KVS-31	KVS28	KVS26	KVS26
Fargo	GC-5035	GC-5035	GC-5040	GC-5020S	GC-5020
ILSCO	IKB-350	IKB-350	IKB-4/0	-	-
(s) Kearney	118112	118112	118111	118110	118110
Penn-Union	VT-4	VT-3	VT-3	VT-2	VT-1
Weaver	350CX	350CX	4/0CX	2/0CX	1/0CX

(s) designates split bolt connectors

Long Connectors (Split Bolt)
Copper to Copper

	<u>2</u>	<u>4</u>	<u>6</u>
Anderson/Sq. D	C-2-L	C-4-L	C-6-L
Blackburn	2H3	4H3	6H3
Burndy	KS-22-3	KS-20-3	KS-17-3
Dossert	DS5-3	DS3-3	DS2-3
Greaves	A-9	A-6	A-4
Joslyn	-	4-F	6-F
Kearney	118107	118105	118103
Penn-Union	SEL-3	SEL-4	SEL-4
Reliable	-	4F	6F
Sherman	-	TSS-4	TSS-6
Weaver	2W3	4W3	6W3

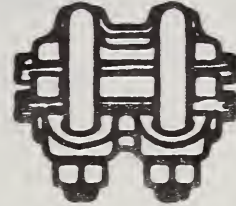
p - Connectors, Transmission

Bolted Type

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to ACSR
ACSR to Copper

Alcoa	580 Series
Blackburn	2U Series
Burndy (ACSR to ACSR)	UP-A, UP-R



When ordering these clamps specify size, stranding and material of both conductors.

Compression Type

ACSR to ACSR
Same Size



<u>Conductor Size</u>	<u>Alcoa</u>	<u>Anderson</u>	<u>Burndy</u>	<u>Kearney</u>	<u>ITT Blackburn</u>
1/0	5074.438	VCJS-50R	YCS25R	OHR-1/0-61AJ	RCJ10
2/0	5074.484	VCJS-50R	YCS26R	OHR-2/0-61AJ	RCJ20
3/0	5075.547	VCJS-61R	YCS27R	OHR-3/0-61AJ	RCJ30
4/0	5075.609	VCJS-61R	YCS28R	OHR-4/0-61AJ	RCJ40
266.8 kcmil	5076 Order by	VCJS-80R	YCS30R	HR-266-267AJ	RCJ266M
336.4 kcmil	5076 stranding	VCJS-80R	YCS33R	HR-336-267AJ	RCJ336M

ACSR to Copper

Alcoa	5070 Series
Anderson/Sq. D	VCJS
Burndy	YCR-R-CA

(Order by conductor sizes)

p - Connectors

(Wedge Type)

<u>Manufacturer</u>	<u>Aluminum to aluminum</u>	<u>Aluminum to copper</u>	<u>Copper to copper</u>	<u>Tap connections (Al to Al, Al to Cu)</u>
AMP	"Ampact" (Aluminum)	"Ampact" (Aluminum)	"Ampact" (Copper)	"Ampact" (Aluminum)
UTM	"Wrench-Lok"	"Wrench-Lok"	--	"Wrench-Lok"

v - Guy attachment
for 5/8" bolt

<u>Type:</u>	<u>Formed Strap</u>	<u>Angle Bolt Eye</u>	<u>Guy Hook</u>	<u>Pole Eye Plate</u>
<u>Maximum Working Load Rating</u>	23,130 N (5200 lbs.)	23, 130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Anderson Elec./ Square D	-	-	-	GSP-05
Barron Bethea	-	-	GH-5*	-
Bethea/National	-	-	AG-5*	PE5-6A
Chance	5004	0100	C203-0168*	-
Continental Elec.	-	-	GA-54*	PEP-66-45
Dixie	D5004	D0100	DD-9460, DD9462*	-
Flagg (MIF)	-	-	P135A, P151X*	PX88
Joslyn	J25164	J6500	J6555, J6556	-
Kortick	K4035, K4047	K3140	-	-
Lapp (Line Ware)	-	-	304014*	304021
McGraw-Edison	DG6H1	DG11E1	DG21H1 DG21H2	-
Power Line Hardware	-	-	HGA-58C*	PGA-548
Util. Service	31030	5531	-	-



*This hook may also be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

Conditional List

v

July 1982

v - Guy attachment

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Joslyn Pole band, with cone head bolt J-6281 and guy clip J-6275 J-6280(for 6" to 10" pole) J-6270(for 8" to 14" pole)	745 8/16/62	To obtain experience. For distribution line only and 10,000 lbs. maximum loading.

ae - Surge Arresters, Substation*
(Lightning Arresters)

<u>Manufacturer</u>	<u>Type</u>	<u>Accepted Ratings - kV</u>	<u>Manufacturer's Classification</u>
General Electric	Alugard	3, 9, 10, 18	Distribution
Joslyn	2RS	9/10, 18	Distribution
	Q	3, 9/10, 18	Distribution
Kearney	Unigap	3, 9, 10, 18	Distribution
McGraw-Edison	ES	3, 9/10, 18	Distribution
	F3	9-120	Intermediate
	G	3-144	Station
Ohio Brass	GP	3-72	Intermediate
	MPA	3-15	Station
	MP	3-48	Station
	MPR	60-312	Station
	DA	3, 9, 10, 18	Distribution
Westinghouse	LV	3-20	Distribution
	IVL	3-120	Intermediate
	CPL	3-312	Station

*For instructions concerning application at substations refer to REA Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

Conditional List

ae

October 1982

ae - Surge Arrester, Substation*

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u>		
Surge arrester, station class, metal oxide type, Tranquell, 2.7 kV thru 588 kV	1164 5/24/79	To obtain experience
Surge arrester, intermediate class, metal oxide type, Tranquell, 3 kV thru 120 kV	1197 10/9/80	To obtain experience
<u>Ohio Brass</u>		
Surge arrester, station class, metal oxide type, Dynavar, 3 kV thru 357 kV	1175 11/2/79 1239 7/29/82	To obtain experience
Surge arrester, intermediate class, metal oxide type, Dynavar, 3 kV thru 120 kV	1242 9/9/82	To obtain experience
<u>McGraw-Edison</u>		
Surge arrester, station class, metal oxide type VariSTAR 3 kV thru 192 kV Type ATZ1A	1223 11/19/81	To obtain experience

*For instructions concerning application at substation refer to REA Bulletin 65-1, "Guide for the Design of Substations for Electric Borrowers." In the purchase of arresters, care should be taken to select the type and voltage rating in accordance with the line voltage and the type of construction (grounded or ungrounded).

aw
July 1982

aw - Washer, Spring

$\frac{1}{4}$ x 1-3/4" x 3 $\frac{1}{2}$ "

<u>Manufacturer</u>	<u>Bolt Size</u>		
	<u>5/8"</u>	<u>3/4"</u>	<u>7/8"</u>
Chance	3540	3541	-
Joslyn	J3540	J3541	J3542
Kortick	K2909	-	-
Fastex (ITW) "Ramp Lok"	1-760-21	1-760-31	1-760-41
McGraw-Edison	DF17W3	DF17W4	DF17W5

ax - Cutout and Arrester, Combination

Nominal System Voltage Cutout Max. Voltage Rating	For 12.5Y/7.2 kV		For 13.2Y/7.6 kV		For 24.9Y/14.4 kV	
	7.8 kV	15 kV	15 kV	18 kV	27 kV	
Application		3Ø Bank 3Ø Sect. 1Ø Sect.	3Ø Bank 3Ø Sect. 1Ø Sect.	1Ø Trans. 50*	3Ø Bank 3Ø Sect. 1Ø Sect.	
Cutout Current Rating Type	1Ø Trans. 50*	1Ø Sect. 100	1Ø Trans. 50*	1Ø Trans. 50*	1Ø Trans. 50*	100
Manufacturer	Catalog Numbers					
Chance	C71A-112PB Series	C71A-112PB Series	C71A-112PB Series	C71A-112PB Series	C70J-2L73 Series	
General Electric	9F80	9F80	9F78A	9F80	9F80	
Joslyn(valve) (valve) (valve)	J9237-Q6 J9238-1Q	J9237-Q2 J9237-Q2/B J9237-Q2/R	J9237-Q6 J9238-1Q	J9267-Q6 J9267-Q2/R J9268-1Q	J9267-Q2 J9267-Q2/B	
Kearney	294072	123511	294073	294074	123514	
McGraw-Edison	AFS800M010	AFS301B Series	AFS301C Series	AFS800M018	AFS300D Series	

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

*These cutouts have open links and must not be used where fault currents are high or for sectionalizing.

(L) Indicates loadbreak type is available.

be - Reclosers, vacuum interrupter

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
* <u>McGraw-Edison</u> (Cont.)		
Three-phase type VWV rated 560 amperes continuous, maximum voltage 27 kV for 14.4/24.9 kV	1021 7/19/73	To obtain experience.
<u>Westinghouse</u>		
Three-phase Type ESV rated 800 amperes continuous, maximum voltage 38 kV for 24.9/14.4 kV	1117 6/23/77 1239 7/29/82	To obtain experience.

*Ratings greater than 100 amp. for 7.2/12.5 kV application, and greater than 200 amp. for 14.4/24.9 kV application, are acceptable only with ground trip devices.

bh
July 1982

bh - Clevis, Service Deadend

Applicable Specification: "REA Specification for Service Deadend
Clevises," D-8

<u>Manufacturer</u>	<u>Clevis Only*</u>	<u>Clevis with dry process spool</u>	<u>Clevis with wet process spool</u>
Chance	0341	0341-0606	0341-C909-1931
Dixie	D0341	D0341-D	D0341-W
Joslyn	J0313	J0314	-
Kortick	K9250	K9100	K9099
McGraw-Edison	DC3F1	-	-
Utilities Service	32136	31136	36136

*Catalog number does not include spool; for spool see Page cm.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

<u>Manufacturer</u>	<u>Acceptable Mounting on Structure</u>	<u>Tilting Ins.</u>		<u>Vertical Break</u>		<u>Side Break</u>		<u>Center Break</u>		<u>Double Break</u>	
		<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>
Brown Boveri Elec. (ITE)	Horizontal	3ST	15-34.5	TTR6	15-161						
A. B. Chance	Horizontal					D2, D3(L)	15-34.5				
	Phase over Phase					D2, D3(L)	15-34.5				
	Vertical					D2, D3(L)	15-34.5				
Johnson	Horizontal			VIP	15-230	LS	15-69	M	15-230		
Joslyn (Hi-Voltage)	Horizontal			RF-2(VL)	15-230	RB-1(VL)	15-25				
	Horizontal					RB-1*	15-115				
Kearney	Horizontal	NE-2	15-34.5	AR	60-P	15-69					
MEMCO	Horizontal	AgF	15-69	EA	15-345			EE	69-230		
	Horizontal	AgC	15-69								
G & W Electric Company	Horizontal			MK-40	15-69	PMB-40A	15-69	LPC	69-230		
Powerdyne (Kearney)	Horizontal							V2-V4	15-230		
	Phase over Phase							V2	15-23		
ANIXTER Royal	Phase over Phase					RG-63(L)	15-69				
	Horizontal					RSL-L(L)	15-69				

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

* These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins.		Vertical Break		Side Break		Center Break		Double Break	
		Type	kV	Type	kV	Type	kV	Type	kV	Type	kV
S & C	Horizontal			Alduti(L)15-34.5		Alduti(L)15-25				Alduti(L)34.5-46	
	Phase over Phase			Alduti(L)15-25		Alduti(L)15-25				Alduti(L)34.5-46	
	Vertical			Alduti(L)*15-34.5		Alduti(L) 15-25				Alduti(L)*34.5-46	
SEECO	Phase over Phase					GOABS(VL)15-69					
	Horizontal	H1	15-230			S	15-69				
Siemens-Allis	Horizontal			TA(VL)	15-69	SSB-T	15-69	CCB	115-230		
								CBL-2	115-230		
Southern States	Horizontal			WAG	15-230	57K	15-69				
Turner	Phase over Phase					(1D,2D,3D)(VL)	15-161				
	Horizontal					1D(VL)	15-161				
USCO	Horizontal			AGT(VL)**15-230		GSH-4(VL)15-138		AGCH**	15-345		
	Horizontal							AGCH-V**34.5-230			
	Phase over Phase					GSH-4(VL)15-138		GCH	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

* These switches, except 34.5 kV Alduti vertical break, are available and accepted in combination with the S & C Type SMD substation fuse cutouts listed on page af-3.

**Also available in bronze in some ratings.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Southern States</u>		
"Pole-Pak" 15-23 kV	800 8/20/64	To obtain experience.
Type EV, horizontal mounted, vertical break, 15-230 kV 600-1200 amp.	859 2/9/67	To obtain experience.
Type ES; 15, 23 and 34.5 kV (horizontal upright models only)	897 7/11/68	1. To obtain experience. 2. For 15 kV and 23 kV distribution lines: insulated interphase and control rod spacers required. See REA Drawings M3-15 and VM3-16. 3. NEMA insulators and steel interphase base required for transmission line structure as in TM-3. 4. Acceptable on steel sub- stations 15 through 34.5 kV with NEMA insulators and uninsulated interphase rods.
Type 57L sidebreak, 115-161 kV, 600 and 1200 amp., horizontal upright	1067 6/12/75	To obtain experience.
<u>G & W Electric Company</u>		
Type MK-40A 15 kV thru 230 kV (horizontal upright mounting).	912 2/20/69	1. To obtain experience. 2. Insulated interphase and control rods required on 15 kV and 23 kV models used on wood structures. 3. Steel interphase base required when mounted as in REA Drawing TM-3.

Conditional List
cg(2)
October 1982

cg - Switch, air, three-pole, group-operated

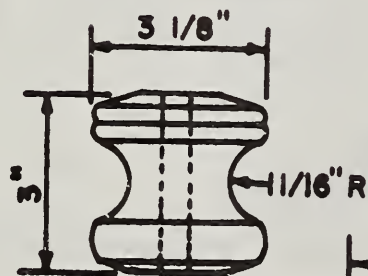
<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>G & W Electric Company (Cont'd)</u>		
"Mark 40"		
115 kV thru 345 kV (horizontal upright mounting)	1005 12/7/72	To obtain experience.
Type LPV, 3-pole 72.5-272 kV, 1200 amp., 1600 amp., 2000 amp., center sidebreak for horizontal mounting	1064 5/1/75	To obtain experience.
<u>Siemens-Allis</u>		
Type AVB(VL), 115-345 kV (Available in copper, 115- 138 kV, order Type CVB(VL)) (Horizontal upright mounting)	1027(10/11/73) 1154(1/4/79) 1157(2/15/79)	To obtain experience.
Type CBL-T, 15-69 kV 600 and 1200 amp (center break, horizontal upright mounting)	1100 10/21/76	1. To obtain experien 2. Insulated interphase and control rods required on 15 kV and 25 kV models used on wood structures.
<u>Morgan</u>		
Type VBV(VL), horizontal upright Pole top mtg., 15-34.5 kV H-frame mtg., 46-230 kV Substation mtg., 15-230 kV	1056 1/2/75 1146 8/31/78	1. To obtain experience. 2. Pole mounted switches must be supplied with insulated interphase and control rods. (Same as above)
Type CVB, center side-break Horizontal pole top mounting, 15-34.5 kV Phase-over-phase mounting, 15-23 kV H-frame and substation mounting, 15-230 kV	1056 1/2/75	

(L) Means full-load interrupter accepted and available.

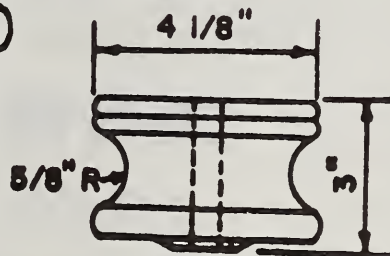
(VL) Means vacuum full-load interrupters are accepted and available.

cm - Insulator, Spool

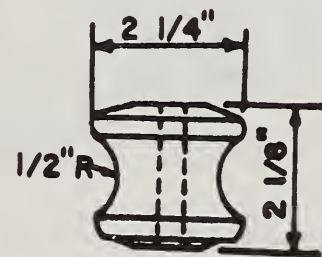
Type:	<u>Secondary (Wet Process)</u>		<u>Service</u>	
			<u>Wet Process</u>	<u>Dry Process</u>
Groove Diameter:	<u>1-3/4"</u>	<u>3"</u>	<u>1-3/8"</u>	<u>1-3/8"</u>
Chance	C909-1032	C909-1034	C909-1031	0606
Hughes	2102	-	-	-
Brown Boveri Elec. (ITE)	2012	2026	2011	-
Joslyn	J151	J0101	J150	J100
Kortick	K516	K522	K513	K514
McGraw-Edison	DE4S3	DE5S1	DE2S2	DE2S1
Porcelain Prod. (Knox)	5101	5119	5107	5207
Universal	1082	-	-	-
Utilities Service	205	31221	208	207



1-3/4" Groove Diameter



3" Groove Diameter



1-3/8" Groove Diameter

cp - Deadend, Compression Type

ACSR

<u>Conductor Size</u>	<u>Alcoa</u>	<u>Anderson/Sq. D</u>
1/0	Order by	VCD-50R
2/0	Conductor	thru
3/0	Size and	VCD-61R
4/0	Stranding	"
266.8 kcmil 26/7	2-piece	VCD-831-1-RM
336.4 kcmil 26/7	alloy	VCD-831-1-RM
477 kcmil 26/7	compression	VCD-832-2-RM
556.5 kcmil 26/7	Type VES or	VCD-833-3-RM
795 kcmil 26/7	HES	VCD-835-4RM
954 kcmil 54/7	"	VCD-835-4RM

<u>Conductor Size</u>	<u>Burndy</u>	<u>Fargo</u>	<u>Kearney</u>	<u>Somerset/Homac</u>
1/0	Type Y-W		104000	Order by
2/0	"		thru	Conductor
3/0	"		104000-03	Size and
4/0	"		"	Stranding
266.8 kcmil 26/7	"	SEDA-1109	104000-05	"
336.4 kcmil 26/7	Type YTW	SEDA-1309	thru	"
477 kcmil 26/7	"	SEDA-1809	104000-14	"
556.5 kcmil 26/7	"	SEDA-2209	"	"
795 kcmil 26/7	"	SEDA-3309		
954 kcmil 54/7	"	SEDA-4121		

ACSR
Adjustable

Somerset/Homac

Order by conductor size and stranding.

Aluminum Alloy
(6201 and 5005)

Conductor Size:

4 thru 4/0

Anderson/Sq. D

Type VOD, Order by conductor size.

Copper

Conductor Size:

2 x 3

4

6

National Tel. Supply

71-258/3X

71-204-P

71-162-J

Copperweld-Copper

Conductor Size:

6A

8A

National Tel. Supply

71-6A-P

71-8A-P

ei - Clamps, suspension with socket eye

ACSR with Straight or Formed Armor Rods

	AWG					kcmil				
	1/0 & 2/0	3/0	4/0	266.8	336.4	477	556.5	795	954	
<u>Iron or Steel Clamps</u>										
Anderson	MS-82-S	-	MS-104-S	MS-104-S	-	-	-	-	-	-
Barron Bethea	FGW-4S	-	-	-	-	-	-	-	-	-
Bethea/National	FS-83-S	-	-	-	-	-	-	-	-	-
Brown Boveri Electric (ITE)	6203	6204	6204	6205	6255	6257	-	-	-	-
Continental	SC-85-S	SC-105-S	SC-105-S	SC-105-S	SC-119-S	SC-136-S	SC-149-S	SC-177-S	SC-192-S	SC-192-S
Joslyn	6203	6204	6204	6205	6255	6257	-	-	-	-
(Brewer-Titchener)										
Knox	6203A-U	6204A-U	6204A-U	6205A-U	6255A-U	6257A-U	-	-	-	-
Lapp	305743S	-	-	-	-	-	-	-	-	-
Ohio Brass	83085	83105	83105	83115	83125	83145	-	-	-	-

ACSR with Straight or Formed Armor Rods

	AWG					kcmil				
	1/0 & 2/0	3/0 & 4/0	266.8	336.4	477	556.5	795	954		
<u>Aluminum Alloy Clamp</u>										
Anderson	HAS-85-S	HAS-104-S	HAS-104-S	HAS-118-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS-182-S	LS-8-S	LS-8-S
Bethea/National	LS-1-S	LS-2-S	LS-2-S	LS-3-S	LS-4-S	LS-6-S	LS-7-S	LS-7-S	LS-8-S	LS-8-S
C & R	CRSC-1S	CRSC-2S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S
Dulmison	-	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS
Brown Boveri Electric (ITE)	9503-U	9504-U	9504-U	9505-U	9506-U	9506-U	-	-	-	-
Joslyn	9503-S	9504-S	9504-S	9505-S	9506-S	9506-S	-	-	-	-
(Brewer-Titchener)										
Knox	9503-U	9504-U	9504-U	9505-U	9506-U	9506-U	-	-	-	-
Lapp	306029S	306030S	306030S	306031S	306032S	306032S	-	-	-	-
Ohio Brass	87085	87105	87105	87115	87135	87135	-	-	-	-
*Preformed	-	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS

*Clevis type available.

ej - Clamps, deadend with socket eye

	ACSR			
	AWG 2/0 to 4/0	266.8	366.4	kcmil 477 556.5 795 954

Iron or Steel Clamps (Require armor tape or liner)

Brown Boveri Electric (ITE)	5001	5002	5002	5003	-	-	-
Joslyn							
(Brewer-Titchener)	5001	5002	5002	5003	-	-	-
Knox	5001	5002-B	5002-B	5003	-	-	-
Ohio Brass	80440	80445	80445	80450	-	-	-

Aluminum Alloy Clamps (Do not require armor tape or liner)

Anderson/Square D	SD-57-S	SD-70-S	SD-86-S	SD-86-S	SD-98S	-	-
Bethea/National	ADE-21-S	ADE-22-S	ADE-23-S	ADE-24-S	ADE-24-S	ADE-2526-S	ADE-2526-S
C & R	CR-10-60S	CR-20-60S	CR-20-60S	-	-	-	-
Brown Boveri Elec. (ITE)	52001	52011	52021	52031	-	-	-
Joslyn							
(Brewer-Titchener)	5200	5201	5202	5203	-	-	-
Knox	5200	5201	5202	5203	-	-	-
Lapp	305757S	305758S	305759S	305760S	-	-	-
Ohio Brass	86536	86540	86546	86546	-	-	-

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

fi
July 1982

fi - Connectors, hot line

Over Armor Rods

<u>Manufacturer</u>	<u>Catalog Number or Series (Al to Al)</u>	<u>Catalog Number or Series (Al to Cu)</u>
Blackburn	PGH	-
Electrical Specialty	AHC-500	AHC-500 GP
Fargo	GA-100 Series	GA-100C Series

fj, fk, fl
October 1982

fj - Bracket, extension

(For use in mounting oil circuit reclosers or sectionalizers)
See Drawing VM3-10A

	<u>Through Bolt Type</u>	<u>Band Type</u>
Aluma-Form	TBRSM-1, TB2M1-9*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357M	
McGraw-Edison	DR2E3	

*For mounting double lug reclosers.

fk - Bracket, oil circuit recloser or sectionalizer

(For cluster mounting of three oil circuit reclosers on pole)

Aluma-Form	RSM-3, 6M3-9*
*McGraw-Edison	DT8C1
Turner	695-3

*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Turner	3CT-PT

gw-1
July 1982

gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: REA Specification T-7, Revision dated
November 1962
Applicable Drawing : TH-11B Series (161 kV maximum)
No braces (TH-11B)
Two vee braces on outside (TH-11BVO)
Two vee braces on inside (TH-11BVI)
Four vee braces (TH-11BV4)

3-5/8" x 9-3/8" x 33' wood crossarm assembly complete
with attaching hardware, fittings, bolts and 3-3/8" x
5-3/8" braces.

<u>Catalog Nos. or Drawing Nos.</u>				
	<u>TH-11B</u>	<u>TH-11BVO</u>	<u>TH-11BVI</u>	<u>TH-11BV4</u>
(Assemblies)	<u>Items</u> gw	<u>Items</u> gw and vo	<u>Items</u> gw and vi	<u>Items</u> gw and vv
American Crossarm and Conduit Co. (1)	70250	7025VO	7025VI	7025V4
Brooks Lumber (1,2)	6411	6411-1	6411-2	6411-3
Cascadian (1,2)	CCC11B72	CCC11B72-VO	CCC11B72-VI	CCC11B72-V4
Hughes Brothers (1,2)	C3316-B	C3316-B	C3316-B	C3316-B

- 1 - Fixed spacer fitting sizes as required
- 2 - Adjustable spacers are available

gw-2
October 1982

gw - Crossarm Assembly for H-frame Construction
(Double Arm) 230 kV (Small Angle)

Applicable Specification: REA Specification T-8
Drawing : TH-231B

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 3-3/8"

<u>Manufacturer</u>	<u>Catalog No.</u>
American Crossarm & Conduit (1)	8026VB
Brooks (1,2)	64231
Cascadian (1,2)	CCC231B82
Hughes (1,2)	C-3338-B
Koppers (1)	REA-230B

Crossarm 5-1/8" x 7-1/2"

Brooks (1,2)	64231L
Cascadian (1,2)	CCC231BT
Hughes (1,2)	C-3338-BL

- 1 - Fixed spacer fitting sizes as required.
- 2 - Adjustable spacers are available.

gy - Crossarm Assembly for H-frame Construction
(Double Arm) 230 kV (Tangent)

Applicable Specification: REA Specification T-8
Drawing : TH-230

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 3-3/8"

<u>Manufacturer</u>	<u>Catalog No.</u>
American Crossarm & Conduit (1)	8025V4
Brooks (1,2)	64230
Cascadian (1,2)	CCC23081
Hughes (1,2)	C-3338-A
Koppers (1)	REA-230S
Niedermeyer-Martin (1)	N-6720

Crossarm 5-1/8" x 7-1/2"

Brooks (1,2)	64230L
Cascadian (1,2)	CCC230T
Hughes (1,2)	C-3338-AL

- 1 - Fixed spacer fitting sizes as required.
2 - Adjustable spacers are available.

gz-1
July 1982

gz - Crossarm Assembly for Wishbone Construction, "Z" Type
(Single Arm)

Applicable Specification: REA Specification T-5
Applicable Drawings : REA Drawings TSZ-1 and TMZ-1

3-5/8" x 5-5/8" wood crossarm assembly complete with
brace and attaching hardware, fittings, and bolts

The following manufacturers have shown compliance with the applicable
specifications for this assembly:

<u>Manufacturer</u>	<u>Catalog Nos. or Drawing Nos.</u>
American Crossarm & Conduit Co.	601TSZ and 602TSZ
Brooks Lumber	64Z1
Hughes Brothers	C-3162-A and C-3162.10

gz-2
July 1982

gz - Crossarm Assembly for Wishbone Construction, "Z" Type
(Double Arm)

Applicable Specification: REA Specification T-5
Applicable Drawings : REA Drawings TSZ-2 and TMZ-2

3-5/8" x 5-5/8" wood crossarm assembly complete with
brace and attaching hardware, fittings and bolts

The following manufacturers have shown compliance with the applicable
specifications for this assembly:

<u>Manufacturer</u>	<u>Catalog Nos. or Drawing Nos.</u>
American Crossarm & Conduit Co.	602TSZ
Brooks Lumber (2)	64Z2
Hughes Brothers	C-3162-B and C-3162.10

(2) Adjustable spacers are available.

sb-1
October 1982

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line
structure use where single-pole switching is permissible

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Ratings</u>	<u>System Voltages Line-to-Line</u>
ANIXTER Royal	BT	15 thru 69 kV	12.5 thru 69 kV
	BLT(PL)	15 and 23 kV	12.5 thru 24.9 kV
Bridges	EH	15 thru 69 kV	12.5 thru 69 kV
	EHL(L)	15 thru 34.5 kV	12.5 thru 34.5 kV
Brown Boveri Elec. (ITE)	HPL	15 thru 69 kV	12.5 thru 69 kV
	DS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Hi-Voltage (Joslyn)	HU	15 thru 69 kV	12.5 thru 69 kV
	HI	15 thru 69 kV	12.5 thru 69 kV
Johnson	HPT	15 thru 69 kV	12.5 thru 69 kV
Kearney	M-72(PL)	15 thru 69 kV	12.5 thru 69 kV
	H-72	15 thru 34.5 kV	12.5 thru 34.5 kV
McGraw-Edison	D2(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
MEMCO	STV	15 thru 69 kV	12.5 thru 69 kV
	STU	15 thru 69 kV	12.5 thru 69 kV
Morgan	DHS	15 thru 69 kV	12.5 thru 69 kV
	(PL included in 15 kV)		
G & W Electric Company	B-2M	15 thru 69 kV	12.5 thru 69 kV
	EV(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
S & C	LBD(PL)	15 thru 34.5 kV	12.5 thru 34.5 kV
	Alduti(L)	15 and 25 kV	12.5 thru 24.9 kV
Seeco	BT	34.5 thru 69 kV	34.5 thru 69 kV
Siemens-Allis	HA	15 thru 69 kV	12.5 thru 69 kV
	HS(PL)	15 and 25 kV	12.5 thru 24.9 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

sb - Switch, disconnect (single-pole, hook-operated station class)

NEMA standard switches for station or line
structure use where single-pole switching is permissible

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Ratings</u>	<u>System Voltages Line-to-Line</u>
Southern States	PBO	15 thru 69 kV	12.5 thru 69 kV
	*PBN	15 thru 23 kV	12.5, 13.2, 24.9 kV
USCO	HH(PL)	15 thru 69 kV	12.5 thru 69 kV

(L) Means solid material load interrupters are available and accepted.

(LV) Means vacuum interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

* With steel base only.

sb - Switch, disconnect (single-pole, hook-operated
distribution class)*

For distribution line use where power class insulation is not required
and single-phase switching is permissible.

(Not suitable for substation use)

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>	<u>System Voltage Line-to-Line</u>
ANIXTER Royal	BLT(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Chance	M3(PL)	15 and 27 kV	12.5 thru 24.9 kV
Brown Boveri Elec. (ITE)	DS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Kearney	D-73(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
McGraw-Edison	D2(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Morgan	DHS (PL included in 15 kV)	15 and 23 kV	12.5, 13.2, 24.9 kV
G & W Electric Company	EV(PL)	15 kV	12.5 kV
S & C	LBD(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Siemens-Allis	HD(PL)	15 and 25 kV	12.5 thru 24.9 kV

NOTE: Switches on this page must be furnished with four bolts for
double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

*Steel bases only.

sc - Regulators, Voltage
12.5/7.2 kV
13.2/7.62 kV

Applicable Specification: REA "Specification for Substation Regulators,"
S-2

<u>Type</u>	<u>Size</u>	<u>Description</u>
<u>General Electric</u>		
VR-1	38.1 - 509 kVA	(SL) Single phase - step type
MLT	500 - 1000 kVA	(S) Three phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three phase - vacuum step type
<u>McGraw-Edison</u>		
VR-32	19.1 - 500 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single phase - step type (Auto-Booster)
<u>Siemens-Allis</u>		
JFR	38.1 - 667 kVA	(SL) Single phase - step type
<u>Westinghouse</u>		
UTS, UTT	167 - 1000 kVA	(S) Three phase - step type

(L) Indicates line use
(S) Indicates substation use

sc - Regulators, Voltage
24.9/14.4 kV

<u>Type</u>	<u>Size</u>	<u>Description</u>
<u>General Electric</u>		
VR-1	72 - 576 kVA	(SL) Single phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 4666 kVA	(S) Three phase - vacuum step type
<u>McGraw-Edison</u>		
VR-32	72 - 667 kVA	(SL) Single phase - step type
AB	50 amp.	(L) Single phase - step type (Auto-Booster)
<u>Siemens-Allis</u>		
JFR	72 - 833	(SL) Single phase - step type

(L) Indicates line use
(S) Indicates substation use

vx
July 1982

vx - Cross brace assembly, 3-3/8" x 5-3/8"
with hardware & fittings (Dwg. TM-110, REA Spec. T-7)

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>American Crossarm & Conduit</u>	
Item 1-vx	1100-1
Item 2-vx	1100-2
<u>Hughes Bros.</u>	
Item 1-vx	1042-1
Item 2-vx	1042-2
<u>Brooks Lumber</u>	
Item 1-vx	X6685-1
Item 2-vx	X6685-2
<u>Joslyn</u>	
Item 1-vx	1-J6046
Item 2-vx	2-J6046
<u>Niedermeyer-Martin</u>	
Item 1-vx	N-6714-1
Item 2-vx	N-6714-2
<u>Cascadian</u>	
Item 1-vx	CCC-67-1
Item 2-vx	CCC-67-2

Cross Brace Assembly, 3-5/8" x 7-1/2" Min.
with hardware and fittings.

Applicable Specification: T-8
Drawing: TM-110A

<u>Manufacturer</u>	<u>Catalog No.</u>
Brooks	X-6695
Hughes	2061 A
American Crossarm & Conduit	1200
Joslyn	J6048
Niedermeyer-Martin	N-6721

zy-1
October 1982

TIMBER INSPECTION AGENCIES AND IDENTIFYING HAMMER STAMPS

<u>Inspection Agencies</u>	<u>Hammer Stamp</u>
Adams Engineering, Incorporated 5003 University Avenue, NE Minneapolis, Minnesota 55421	AE
Anding Inspection Company 3105 Delwood Drive Hattiesburg, Mississippi 39401	A in a circle
Bode Inspection Company P. O. Box 591 Lake Oswego, Oregon 97034	B
D. A. Cole Inspection Service, Incorporated P. O. Box 275 Hammond, Louisiana 70404	DAC
Gordon J. Daugharty Inspection Service 1985 Highway 2 East #29 Kalispell, Montana 59901	D
Froehling & Robertson, Incorporated P. O. Box 27524 Richmond, Virginia 23261	FR
Robert W. Hunt Company 810 South Clinton Street Chicago, Illinois 60607	H
Jason Associates, Incorporated P. O. Box 42 Fort Collins, Colorado 80522	J
McCallum Inspection Company P. O. Box 13266 Chesapeake, Virginia 23325	MIC
McCutchan Inspections, Incorporated 8525 N. Lombard Street Portland, Oregon 97203	MC
CM Rou Services, Incorporated 3059 Ken Dale Drive Mobile, Alabama 36606	CMR
SamCo Inspection & Consulting Service 3638 Honeysuckle Road Montgomery, Alabama	SC

TIMBER INSPECTION AGENCIES AND IDENTIFYING HAMMER STAMPS

<u>Inspection Agencies</u>	<u>Hammer Stamp</u>
Senft Inspection Service P. O. Box 836 Ponderay, Idaho 83852	S
Southern Wood Products Inspection Company P. O. Box 15263 Pensacola, Florida 32504	SWP in a circle
Southwestern Laboratories P. O. Box 8768 Houston, Texas 77009	SL
Thurlow Inspection Agency P. O. Box 123 Sandpoint, Idaho 83864	T
Timber Products Inspection P. O. Box 919 Conyers, Georgia 30207	TP
A. W. Williams Inspection Company, Inc. P. O. Box 2107 Mobile, Alabama 36601	AWW

zz - Poles

Pressure Treatment

	<u>Insured Warranted</u>	<u>Independently Inspected</u>
Oliver Treated Products Co., Inc.	-	Hammond, La.
Pacific Wood Preserving	-	Cloverdale, Cal.
Panama Timber Co.	-	Panama, Okla.
Penta Wood Products, Inc.	-	Siren, Wisc.
Pressure Treated Timber Co.	-	Boise, Idaho
Selma Treating Company	-	Selma, Cal.
Southern Wood Piedmont Co.	-	Augusta, Ga. Baldwin, Fla. East Point, Ga. Macon, Ga. Wilmington, N. C.
Southeastern Wood Preserving, Inc.	-	Canton, Miss.
Southwest Forest Industries	Prescott, Ariz.	Prescott, Ariz.
Stallworth Timber Co., Inc.	-	Beatrice, Ala. Winnfield, La.
Standard Wood Preservers of Shreveport, Inc.	-	Shreveport, La.
John C. Taylor Lumber Sales, Inc.	-	Sheridan, Ore.
Texas Electric Cooperative, Inc.	-	Jasper, Texas

zz-6
July 1982

zz - Poles

Pressure Treatment

	<u>Insured Warranted</u>	<u>Independently Inspected</u>
Texas Tie & Timber Co. (W. J. Smith Wood Preserving Co.)	-	Denison, Texas
Union Timber Corp.	-	Homerville, Ga.
Weekly Lumber Co.	- -	Rockledge, Fla. Tampa, Fla.
Western Tar Products Corp.	-	Terre Haute, Ind.
Western Wood Preservin Co.	-	Sumner, Wash.
Wheeler Div., St. Regis Paper Company	Whitewood, S. D. Cass Lake, Minn.	Whitewood, S. D. Cass Lake, Minn.
Whitewood Post & Pole Co.	Whitewood, S. D.	Whitewood, S. D.
Wood Treating, Inc.	-	Picayune, Miss.
Wyckoff Company	- -	W. Seattle, Wash. Bainbridge Island, Wash.

U ae - Arresters, Surge
(For underground system pole risers or pad-mounted equipment)

(Shielded for Underground System Pad-mounted Equipment)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>McGraw-Edison</u>		
Metal oxide, AMOV1 U.D 10, 18 kV	1223 11/19/81	To obtain experience
<u>RTE</u>		
Metal Oxide Elbow Arrester M.O.V.E. 9, 18 kV	1185 4/24/81	To obtain experience

(For Underground System Pole Risers)

<u>General Electric</u>		
Metal Oxide, Tranquell U.D 10, 18 kV	1185 4/24/80	To obtain experience
Metal Oxide, Tranquell Intermediate Class 9, 10, 18 kV	1197 10/9/80	To obtain experience
<u>McGraw-Edison</u>		
Metal Oxide, AVZ1B 9/10, 18 kV	1223 11/9/81	To obtain experience
<u>Ohio Brass</u>		
Metal Oxide, DynaVar VR UD 9, 10, 18 kV	1236 6/10/82	To obtain experience.
Metal Oxide, DynaVar Intermediate Class 9, 10, 18 kV		

U an - Transformers, distribution
pad-mounted, dead-front

(For underground application)

Applicable Specifications: "REA Specifications for Pad-Mounted
Transformers," U-5

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three-Phase</u>
Central Moloney (2,4)	"REA-LP" 25-167 kVA	
Chance (2)	"Turf Hugger-R" 10-100-kVA	"Turf Hugger-R" 45-500 kVA
Dowzer (3,4)	"METRI-PAD" 25-167 kVA	"PM3W-R" 75-500 kVA
ERMCO (1) (4,6) (2,4)	"Trimline" 10-50 kVA "Low-Profile" 10-50 kVA "Low-Profile" 75 kVA	
General Electric (2,4)	"Mini-Pad III - REA" 10-167 kVA	"Compad II - REA" 75-2500 kVA
Howard (2,4)	"HiPad REA" 10-167 kVA	"HiPad 3 REA" 45-2500 kVA
Kuhlman (2,4)	"Lo-Pak ALR" 25-167 kVA	
McGraw-Edison (2,4)	Series 20/30 REA 25-167 kVA	"REA Pad-Mount" 75-2500 kVA
NECO (2)	HMM-R, 10-50 kVA SP-R, 75-167 kVA	TP-R, 45-1000 kVA
H. K. Porter (2,4) (Delta-Star)	"Low Profile U 5-R" 25-167 kVA	"Porter U5-R3" 225-2500 kVA
RTE (2,4)	"REA Shrubline" 15-167 kVA	"REA Terra-Tran" 45-2500 kVA
United (Ky. AEC) (2,4)	"Pad-Mount" 15-75 kVA	

- (1) 7.2/12.5 and 7.6/13.2 kV
- (2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
- (3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
- (4) Dual voltage - same as for 14.4/24.9 kV, single phase
- (5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only
- (6) 14.4/24.9 kV

July 1982

U an - Transformers, Distribution,
Direct Burial*

(5-25 kVA only)

Conditions: To obtain experience.

ManufacturerMetallic Tank
(Cathodic protection
required)Nonmetallic Tank
(Cathodic protection not
used)Central Moloney
(Meeting 993, 6/8/72)"Trenchmite" 15-25 kVA
Radial Feed or Loop Feed
(same end) onlySargent-Tyee
(Meeting 1016, 5/10/73)"No-Korrod"
10-25 kVA

*Direct burial transformers are at an early stage in their development. Large numbers of direct burial transformers should not be purchased from any one manufacturer by any one borrower in any one year. Carefull location records should be kept.

U ax
October 1982

U ax - Cutout and Arrester, Combination
for Underground System Pole Risers

Nominal System Voltage	For 12.5Y/ 7.2 kV	For 13.2Y/ 7.6 kV	For 24.9Y/ 14.4 kV	
Cutout Maximum Voltage Rating	7.8 kV 1 ϕ	15 kV 3 ϕ	15 kV 1 ϕ and 3 ϕ	27 kV 1 ϕ and 3 ϕ
Application	Risers	Risers	Risers	Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps
<u>Manufacturer</u>	<u>Catalog Numbers</u>			
Chance	C71D-112PB Series	C71D-112PB Series	C71D-112PB Series	C70J-2L74 Series
General Electric	9F80	9F80	9F80	9F80
Joslyn	J9237-P2	J9237-P2/R	J9237-P2-R	J9267-D2
McGraw-Edison	AFS300B Series	AFS300C Series	AFS300C Series	AFS301D Series
Southern States	CA Series	CA Series	CA Series	CA Series
Westinghouse	7.8LBU-II/ 10 LV	15LBU-II/ 10 LV	15LBU-II/ 10 LV	24.9LBU-II/ 18 LV

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A. in REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

U fz - Transformer Connector Block, Insulated

Multiple Cable Connectors

Watertight - For use in all locations.

<u>Manufacturer</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Utilco	Set Screw	PTF-SS, Watertight Insulated transformer Connector block Stud Mole with sealing sleeve
Burndy	Lug	
<u>Non-Watertight - For use in above grade locations only</u>		
Alcoa	Lug	Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots
Alcon	Set Screw	VBTT Series with double sealing sleeve
Electrical Spec. Prod.	Lug	Type SU (Permanent)
	Lug	Types SUR and RDSR (Removable) (With Types LA and A1 lugs and sleeve kits)
	Set Screw	Type UPS-I (Permanent) Type UPM-I (Disconnectable)
Fargo	Bolted	GUC Series
	Set Screw	GUS-200S Series
Homac	Lug	DF Series
	Lug	FTU 125 Series (Disconnectable) with flood seal sleeve kit
	Set Screw	UT-R Series
ITT	Lug	SCU, with lugs and sleeves
	Set Screw	TSB-J58C (Permanent)
	Set Screw	TSB-D58C (Disconnectable)
Penn Union	Lug	Type DBAT-LH (Disconnectable)
	Lug	Use with Series DBTB, DBTBF and DBTH lug and sleeves kits
Reliable	Set Screw	15912-REA (Disconnectable)
RTE	Set Screw	Uni-Joint (Disconnectable)
	Set Screw	Uni-Joint (Permanent)
Utilco	Set Screw	PTF-IN (Permanent)
	Set Screw	PTF-IN-J (Disconnectable)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U fz-2
July 1982

U fz - Transformer Connector Block, Insulated
Single Cable Connectors

Non-Watertight - For use in above grade locations only

Manufacturer

Catalog Number

Electrical Spec. Prod

Type SM transformer bushing
connector kit. (Stud to
aluminum cables through
350 kcmil)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U gk - Terminations, Outdoor
(With mounting hardware)*

(When ordering specify conductor size, type, whether
copper or aluminum, insulator diameter, and type
of mounting desired)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Elastimold (ESNA)</u>		
Style 16-THG (15 and 25 kV)	921(6/26/69)	To obtain experience.
Style 35-MT (35 kV)	945(6/11/70) 1098(9/23/76)	
<u>General Electric</u>		
Termi-Matic, Type G (15, 25 and 35 kV)	938(3/5/70) 914(3/20/69) 1083(2/5/76)	To obtain experience.
<u>Joslyn</u>		
"Easy-On II" (15, 25 and 35 kV)	1111 3/31/77	To obtain experience.
<u>3M</u>		
5900 Series	966	To obtain experience.
15 kV (4/0 AWG and larger)	5/6/71	
25 kV (#2 AWG thru 750 kcmil)	969	
"Quick-Term" 5800 Series	6/17/71	
bracket mounted,	1054	
15 kV (#2 AWG thru 3/0 AWG)	11/27/74	
MT Series		
15 kV (4/0 AWG and larger)	1083	
25 kV, 35 kV	2/5/76	
"Quick-Term II" Series (15, 25 and 35 kV)	1238(7/15/82)	
<u>ITT Blackburn</u>		
Type MP (15, 25 and 35 kV)	1043(6/13/74) 1166(6/21/79)	To obtain experience.

*Mounting hardware is used to attach termination to mounting bracket
(U hd or U hj).

Conditional List

U gk(1.2)

July 1982

U gk - Terminations, Outdoor
(With Mounting Hardware)*

(When ordering specify conductor size, type, whether
copper or aluminum, insulation diameter, and type
of mounting desired)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Raychem</u> Thermofit HVT (15, 25 and 35 kV)	1054 11/27/74	To obtain experience.
<u>Bishop</u> SWO Kit (15, 25 & 35 kV)	1109 3/3/77	To obtain experience.
<u>G & W</u> "Slip-on Dry" 15 kV, SD-7 25 kV, SD-8 35 kV, SD-9	1150(11/2/78) 1166 6/21/79	To obtain experience.
<u>RTE</u> Fasterm Series (15 & 25 kV)	1162 4/26/79	To obtain experience.
<u>Sigmaform</u> Q-Cap Series STK (15 & 25 kV)	1212 5/21/81	To obtain experience.

*Mounting hardware is used to attach termination to mounting bracket
(U hd or U hj).

October 1982

U he - Enclosures, Sectionalizing Equipment
(600 amp.)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>RTE</u> Type LBS, single and three phase, pad-mounted 15 kV	1095 8/11/76	To obtain experience.
<u>Joslyn</u> Type SG6 (submersible) three-phase switching equipment, 600 amp., 15 or 25 kV	1112 4/14/77	To obtain experience
<u>Kearney</u> <u>Series QE, QEE, QEI</u> (all with option D1) pad-mounted 15 kV, 600 amp three-phase switching and 200 amp single pole switching	1184 4/10/80	To obtain experience.
<u>Series VE</u> - pad-mounted, 15 kV and 25kV, single phase and three-phase vacuum switching, fused or unfused 200 or 600 amps	1184 4/10/80	To obtain experience.
<u>Series VP</u> - submersible, single phase and three- phase, vacuum switching, 200 or 600 amp, 15 and 25 kV, with or without VACOP remote operator	1184 4/10/80	To obtain experience.

NOTE 1. Enclosures on this page must comply with the deadfront requirements of REA Spec. U-4.

NOTE 2: Single-pole switching of three-phase underground circuits may cause ferroresonance. Refer to REA Bulletin 61-3.

U hg
July 1982

U hg - Anti-tamper Shield

Manufacturer

Catalog No.

Formed Plastics

7262 Series

McGraw-Edison

UM8Y1

Sonoco

S24 Series

U hp - Terminations, Elbow
(Rated for switching on three-phase systems)

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Kearney</u>		
15 kV, Loadbreak with voltage test point 1115-FC Series	1005 12/7/72 1077 11/13/75	To obtain experience.
<u>RTE</u>		
15 kV, Loadbreak SBT IV 2604600B Series with test point 2604599B Series without test point	1032 12/20/73 1122 9/8/77	To obtain experience.
25 kV, Loadbreak SBT 2604740B Series with test point 2604741B Series without test point	1148 9/28/78	
<u>Elastimold (ESNA)</u>		
15 kV, Loadbreak without voltage test point Style 165-LR	1068 6/26/75	To obtain experience.
15 kV, Loadbreak with voltage test point Style 166-LR		
25 kV, Loadbreak without voltage test point Style 271-LR		
25 kV, Loadbreak with voltage test point Style 272-LR		
<u>General Electric</u>		
15 kV, Loadbreak 9U01A--4-- Series	1133	To obtain experience.
25 kV, Loadbreak 9U01B--5-- Series	2/16/78	
<u>ITT Blackburn</u>		
15 kV, Loadbreak JT2B (without test point)	1054 11/27/74	To obtain experience.

Conditional List

U hp(5)

October 1982

U hp - Terminations, Elbow
(Rated for switching on three-phase systems)

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Burndy</u>		
15 kV, Loadbreak		
LBT112M (without test point)	1162(4/26/79)	To obtain experience.
LBT112MT (with test point)	1165(6/7/79)	
25 kV, Loadbreak		
LBT262M (without test point)	1240	To obtain experience.
LBT262M (with test point)	8/12/82	